

From the INTERNATIONAL SEARCHING AUTHORITY

**PCT**

NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL SEARCH REPORT  
OR THE DECLARATION

(PCT Rule 44.1)

**01 APR 2005**

To:

VERMETTE & CO.  
Box 40, Granville Square  
230-200 Granville Street  
Vancouver, British Columbia V6C 1S4  
CANADA

Date of mailing  
(day/month/year)

23/11/2004

Applicant's or agent's file reference

1491-143

**FOR FURTHER ACTION**

See paragraphs 1 and 4 below

International application No.

PCT/CA 03/01514

International filing date  
(day/month/year)

01/10/2003

Applicant

POWERTECH INDUSTRIES INC.

1. ☒ The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

**Filing of amendments and statement under Article 19:**

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

**When?** The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

**Where?** Directly to the International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland  
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority



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Authorized officer

Pieter Nijhuijs

## NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

### INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

#### What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

#### When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

#### Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

#### How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

#### What documents must/may accompany the amendments?

##### Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

## NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:  
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:  
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:  
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or  
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:  
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

### "Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

**It must be in the language in which the international application is to be published.**

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

### Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

### Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>1491-143</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/CA 03/01514</b>	International filing date (day/month/year) <b>01/10/2003</b>	(Earliest) Priority Date (day/month/year) <b>01/10/2002</b>
Applicant  <b>POWERTECH INDUSTRIES INC.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 7 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

### 1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☒ Unity of invention is lacking (see Box II).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1a

☐ None of the figures.

## Box III TEXT OF THE ABSTRACT (Continuation of Item 5 of the first sheet)

The invention consists of a pulse combustor, comprising two spaced apart outer plates (23,30), the outer plates having flat outer regions, conical regions (74,14) inside of the flat regions and central hubs, where the volume between conical regions of the plates defines a combustion chamber (70). The pulse combustor further comprises a plurality of intermediate plates (24,26,28) located between the outer plates, the plurality of intermediate plates being spaced apart to form tailpipe regions (40,41,42,43) therebetween and between the outer plates and adjacent ones of the intermediate plates and a burner (12) coupled to one of the hubs, the burner operative to ignite a fuel/air mixture in the combustion chamber. The outer and intermediate plates have spiral coolant passageways therein for conducting cooling fluid to cool expanding gases traveling between the plates through the tailpipe regions. The invention further consists of a burner assembly for use in a combustion chamber.

# INTERNATIONAL SEARCH REPORT

PLI/CA 03/01514

## Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-9

Pulse combustor with plurality of tail pipe regions  
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2. claims: 10-11

Burner with hollow tube and conic deflector  
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**A. CLASSIFICATION OF SUBJECT MATTER**

IPC 7 F23C11/04 F23M5/08 F24H1/43 F23D14/58

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 F23C F24H F23D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6 035 810 A (MOVASSAGHI MEHRZAD) 14 March 2000 (2000-03-14) figures 1,4,15 column 4, line 10 - line 25 column 6, line 45 - line 52	1-5,8
Y	WO 00/12934 A (CHATO JOHN D ; CLEAN ENERGY COMBUSTION SYSTEM (CA)) 9 March 2000 (2000-03-09) page 4, line 5 - line 10 page 6, line 8 - line 10; figure 2	1-5,8
A	WO 01/53750 A (LOCHINVAR CORP) 26 July 2001 (2001-07-26) figures 6,12 page 20, paragraph 5 - page 21, paragraph 1	6,7
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.**\* Special categories of cited documents :**

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

16 November 2004

Date of mailing of the international search report

23. 11. 2004

Name and mailing address of the ISA

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Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Mougey, M



C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 000 930 A (KELLY JOHN T ET AL) 14 December 1999 (1999-12-14) column 5, line 31 - column 6, line 31; figure 9 -----	9
A	EP 0 950 853 A (BRAY TECHNOLOGIES PLC) 20 October 1999 (1999-10-20) paragraph [0034]; figure 4 -----	6,7
A	US 4 968 244 A (MOVASSAGHI MEHRZAD) 6 November 1990 (1990-11-06) column 3, line 15 - column 4, line 14; figure 1 -----	1
X	US 6 379 146 B1 (MCDONALD JOHN ET AL) 30 April 2002 (2002-04-30)	10
Y	abstract; figures 1-4 column 5, line 6, paragraph 16 -----	11
Y	PATENT ABSTRACTS OF JAPAN vol. 0071, no. 37 (M-222), 15 June 1983 (1983-06-15) -& JP 58 052908 A (TAKA SEISAKUSHO:KK), 29 March 1983 (1983-03-29) abstract; figure 3 -----	11
X	US 4 492 562 A (MICHEL FREDERICK A) 8 January 1985 (1985-01-08) abstract; figure 3 column 4, line 40 - line 56 column 5, line 23 - line 41 -----	10
X	US 4 702 691 A (OGDEN RICHARD) 27 October 1987 (1987-10-27) column 2, line 45 - line 54 figure 2 -----	10
A	DE 565 470 C (MIAG MUEHLENBAU UND IND AKT GE) 1 December 1932 (1932-12-01) the whole document -----	11
A	DE 10 41 888 B (DIEPENBROCK & REIGERS N V) 30 October 1958 (1958-10-30) the whole document -----	11

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6035810	A	14-03-2000	AT 407293 B	26-02-2001
			AT 910396 A	15-06-2000
			AU 4781296 A	19-06-1997
			WO 9720171 A1	05-06-1997
			CH 693464 A5	15-08-2003
			DE 19681671 T0	15-10-1998
			DK 72598 A	30-06-1998
			GB 2323662 A ,B	30-09-1998
			JP 2000500562 T	18-01-2000
			SE 522084 C2	13-01-2004
			SE 9801925 A	29-07-1998
WO 0012934	A	09-03-2000	AU 5403599 A	21-03-2000
			WO 0012934 A1	09-03-2000
			US 6464490 B1	15-10-2002
WO 0153750	A	26-07-2001	AU 2777601 A	24-07-2001
			AU 2781001 A	31-07-2001
			WO 0151853 A1	19-07-2001
			WO 0153750 A1	26-07-2001
			US 2002092482 A1	18-07-2002
			US 2003005892 A1	09-01-2003
US 6000930	A	14-12-1999	NONE	
EP 0950853	A	20-10-1999	EP 0950853 A2	20-10-1999
US 4968244	A	06-11-1990	CA 1319885 C	06-07-1993
US 6379146	B1	30-04-2002	NONE	
JP 58052908	A	29-03-1983	NONE	
US 4492562	A	08-01-1985	NONE	
US 4702691	A	27-10-1987	CA 1243937 A1	01-11-1988
			DE 3573463 D1	09-11-1989
			EP 0158414 A2	16-10-1985
			JP 1802588 C	26-11-1993
			JP 5000606 B	06-01-1993
			JP 60213715 A	26-10-1985
DE 565470	C	01-12-1932	NONE	
DE 1041888	B	30-10-1958	NONE	